KNOWLEDGE OF ORAL HEALTH AND PERIODONTITIS – CONNECTION WITH SYSTEMIC HEALTH AND PREDISPOSING FACTORS

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Abstract: Poor oral health is a global public health problem that has a significant social, psychological and economic impact on both individuals and the whole community and on the provision of health services. Periodontal diseases contribute greatly to poor oral health, but public health approaches to their control and prevention have not yet reached the level of attention given to dental caries. Periodontal problems are thought to be the 6th most common disease worldwide - with an overall prevalence of 11.2% and affecting around 538 million people. The overall prevalence of periodontitis increases with age and its incidence rises sharply in people between 50 and 60 years of age. People with severe periodontal disease are at risk of significant tooth loss, e-denticulation and impaired masticatory function, thereby affecting their nutrition, quality of life and self-esteem, with significant socio-economic consequences.

Our purpose was to investigate the awareness of periodontal diseases and their relationship with systemic diseases and conditions among students of Faculty of Public Health, Medical University – Sofia. An anonymous written survey has been conducted using survey cards on paper, maintaining user anonymity. A standardized questionnaire including 42 questions has been used. The questionnaire is divided thematically into 3 parts: 1. Demographic data; 2. Awareness of periodontal and systemic health and 3. Significance of risk factors. The total number of students included in our study was 256 and all of them belonged to the specialty "nurse".

77% of the students confirm that oral diseases are connected with gingival inflammation expressed as bleeding, as well as the vice-versa – the same percentage (78%) state that the bleeding itself is a symptom of gingival inflammation. Some bad routine habits as the improper teeth brushing could cause gingival recessions (81% of the participants respond with "Yes" to this question). According to the survey, the risk factors for periodontitis can be as follows: sex and age (41%), smoking (95%), an accompanying genetic disease (59%), emotional stress (64%), an accompanying chronic illness (like diabetes) (40%); poor nutrition diet (73%), overweight (31%) and others. Only 55% of the interviewed are familiar with the relationship between periodontitis and the level of the inflammatory cytokines, as well as between periodontitis and the PLBW syndrome during pregnancy. Almost 90% (86%) of the students believe there is a link between the oral and the systemic health.

Diseases of the oral cavity and specifically periodontal diseases have a certain impact on systemic health, which determines the need for the participation of all health care professionals in public programs for the prevention of periodontal diseases and maintenance of clinical periodontal health. The role of health professionals in improving the oral health of the population depends on their awareness and knowledge of oral diseases and their impact on general health, their attitude towards dentistry and their daily commitment to oral health care.

Keywords: oral health, periodontitis, questionnaire, risk factors

1. INTRODUCTION

Poor oral health is a global public health problem that has a significant social, psychological and economic impact on both individuals and the whole community and on the provision of health services. Poor oral health is manifested by the presence of dental caries, periodontal success or in the extreme - complete loss of teeth.

Periodontal disease is strongly associated with systemic diseases, however, its worldwide distribution is not fully understood (Nazir et al., 2020). According to Nazir M and co-authors, the distribution of periodontitis in adults differed significantly in low- (28.7%), lower-middle- (10%), upper-middle- (42.5%), and high-income countries (43.7%) (P = 0.04). However, no significant differences in periodontitis were observed in adolescents and older

persons in low- to high-income countries (Nazir et al., 2020). Ageing is a primary risk factor for the development of periodontitis, as it is generally characterized by alveolar bone loss and tooth loss in the geriatric population (Zhu, Tang, Hu, Gu, & Yang, 2023). Clinical research has demonstrated an increase in both the prevalence and severity of periodontal disease with advancing age, particularly after 30–40 years of age, and further exacerbation in most adults aged over 50 years (Bertl et al., 2020).

Periodontal disease is the most common cause of tooth loss among adults (Research, 2021). People with severe periodontal disease are at risk of significant tooth loss, e-denticulation and impaired masticatory function, thereby affecting their nutrition, quality of life and self-esteem, with significant socio-economic consequences. The economic burden of periodontal disease is significant: it caused an estimated loss of $154.06B in the US and €158.64B in Europe, in 2018 (Botelho et al., 2022).

The purpose of this study is to investigate the awareness of periodontal diseases and their relationship with systemic diseases and conditions among students of Medical University – Sofia, as well as the knowledge about the risk factors for the disease.

2. MATERIAL AND METHODS

An anonymous written survey including 42 questions was conducted using survey cards on paper. The survey card consisted only of closed questions with trichotomous answers ("Yes"/"No"/"I am not sure"), which allows for quick completion by the respondents, as well as subsequent facilitated statistical processing and analysis of the results with greater credibility. The questionnaire was divided thematically into 3 parts: 1. Demographic data; 2. Awareness of periodontal and systemic health and significance of risk factors - includes questions about the causes, development and consequences of periodontal diseases and related systemic risk factors; 3. Anamnestic data - includes 20 questions about oral hygiene procedures, the presence of periodontal problems and some systemic diseases. The answers were analyzed and represented graphically. In this study we present our results for points 1 and 2 and discuss the existing knowledge towards the risk factors for periodontal diseases.

3. RESULTS

Demographic data results

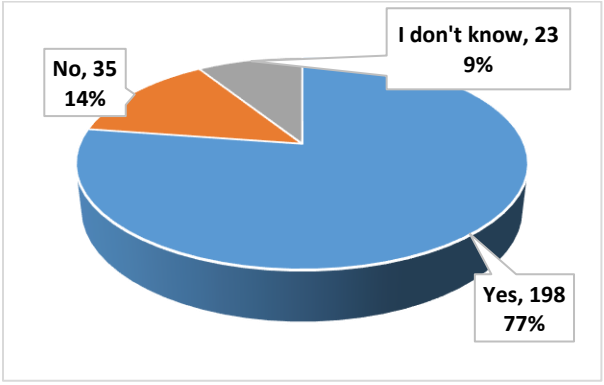
The total number of students included in our study were 256. As all of them belonged to the specialty “nurse”, the majority were female (240) and few were males (16). We have representatives of different levels of their studies distributed as follows- 67 first course of their studies (26%); 101 in the second course (40%) and 88 – third course (34%). The average age was 34.6 years.

Oral health data results

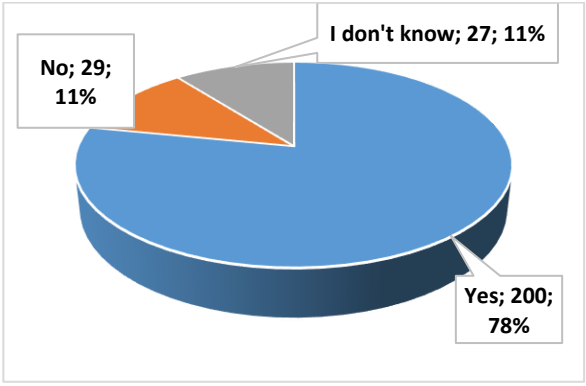
77% of the students confirm that oral diseases are connected with gingival inflammation expressed as bleeding (Figure 1A), as well as the vice-versa – the same percentage (78%) state that the bleeding itself is a symptom of gingival inflammation (Figure 1B). Some bad routine habits as the improper teeth brushing could cause gingival recessions (81% of the participants respond with “Yes” to this question) (Figure 2).

Figure 1. A. Are the oral diseases connected with gingival inflammation? B. Could bleeding be a symptom of gingival inflammation?

A.

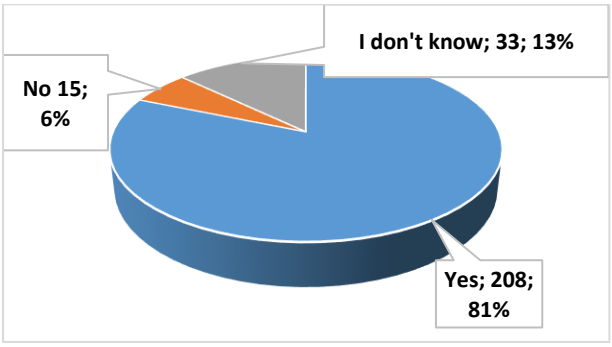


B.



Source: Authors’ research

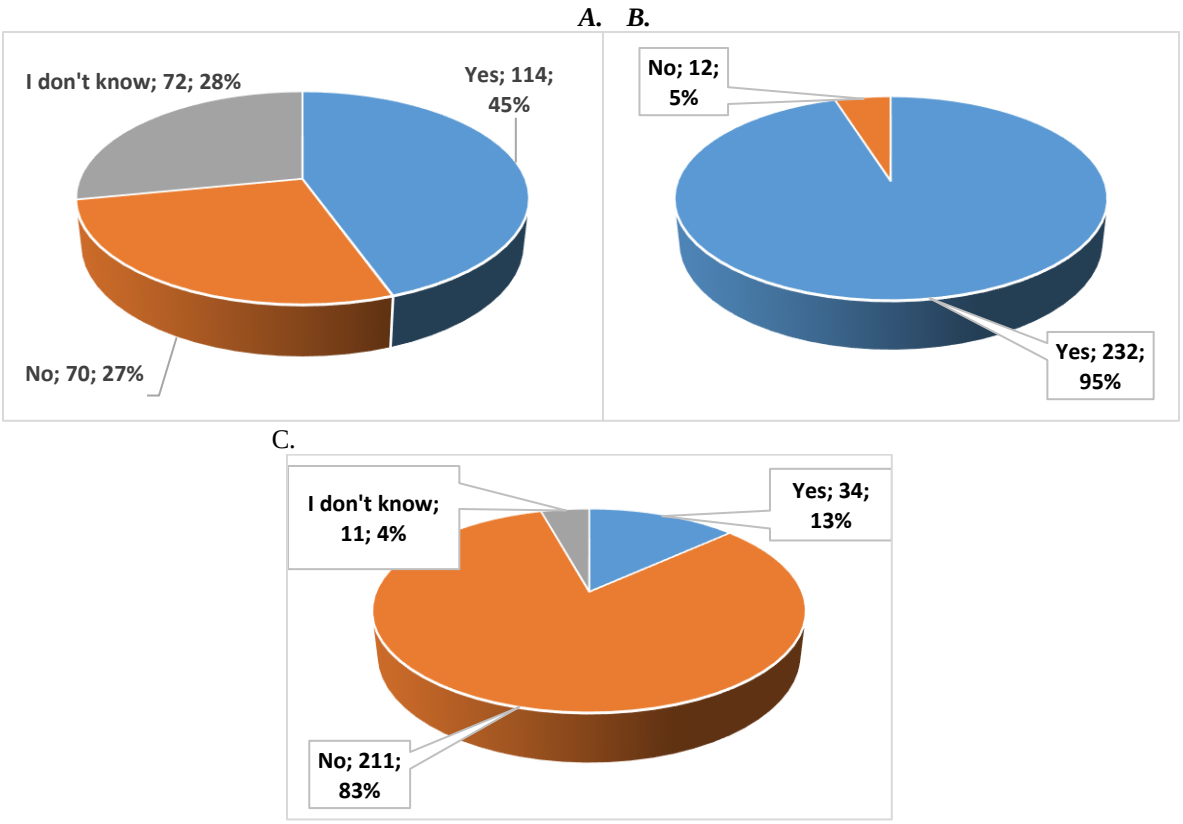
Figure 2. Can the improper tooth brushing cause gingival recessions?



Source: Authors' research

Almost 30% state that gingivitis is associated with a bone loss (Figure 3A). However, most are aware that periodontitis could lead to teeth loss (Figure 3B). Surprisingly, according 13% of the students consider that tartar removal could be harmful to their teeth (Figure 3C).

Figure 3. A. Is gingivitis connected with bone loss? B. Can periodontitis lead to teeth loss? C. Could tartar removal be harmful to the teeth?



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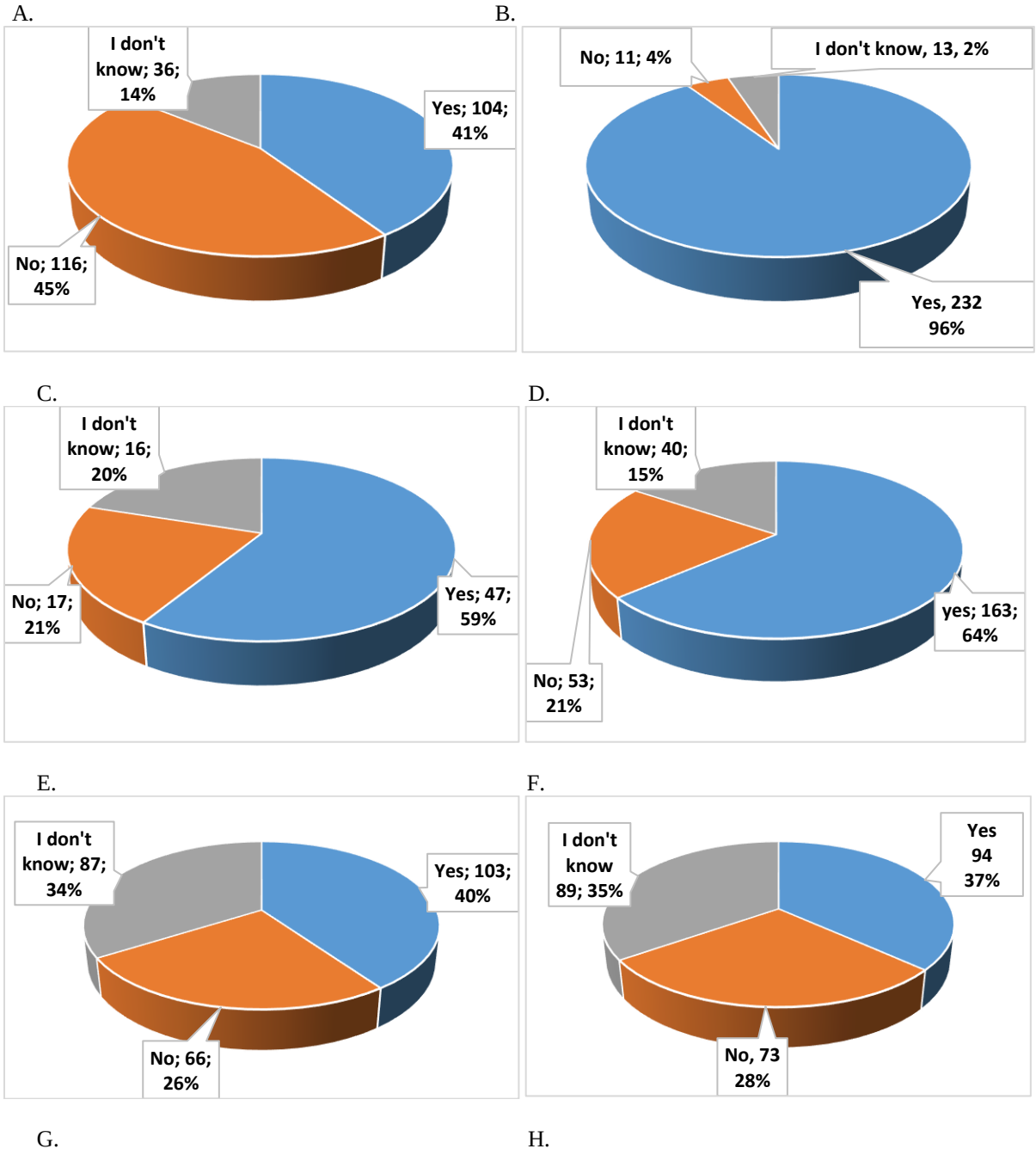
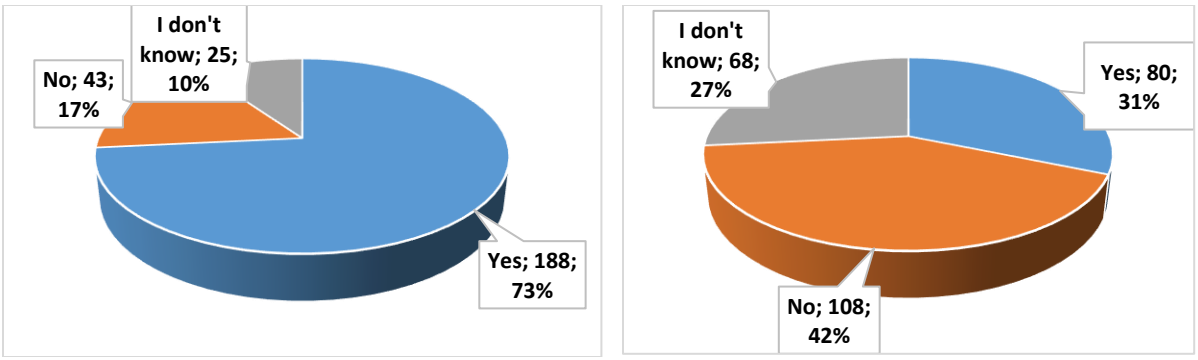
The majority of the participated individuals agree on the statement that the teeth loss can interfere with the speech and articulation (94%) and that the damaged teeth can worsen the quality of life (95%).

Risk factors for periodontitis

According to the survey, the risk factors for periodontitis can be as follows: sex and age (41%), smoking (95%), an accompanying genetic disease (59%), emotional stress (64%), diabetes (40%); cardiovascular diseases (37%), poor nutrition diet (73%), and overweight (31%). (Figure 4).

Figure 4. Risk factors for periodontitis according to the survey. A. Are sex and age; B. Smoking; C. Genetic diseases; D. Emotional stress; E. Diabetes; F. Cardiovascular diseases; G. Poor nutrition diet; H. Obesity.



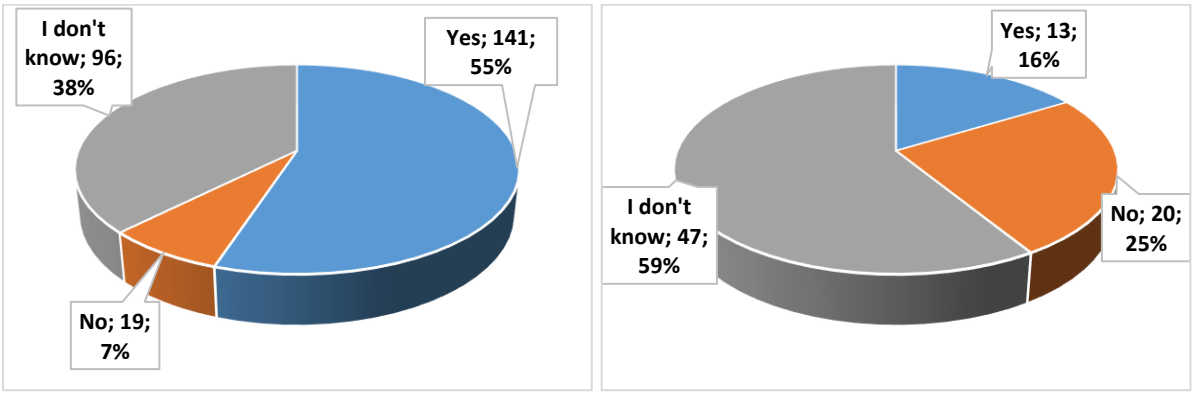


Source: Authors' research

Only 55% of the interviewed are familiar with the relationship between periodontitis and the level of the inflammatory cytokines (Figure 5A), and only 13% - between periodontitis and the PLBW syndrome during pregnancy (Figure 5B).

Figure 5. A. Periodontal diseases affects the levels of the inflammatory factors (cytokines), B. There is a link between the periodontal disease in pregnant women and the phenomenon PLBW (pre-term low birth weight).

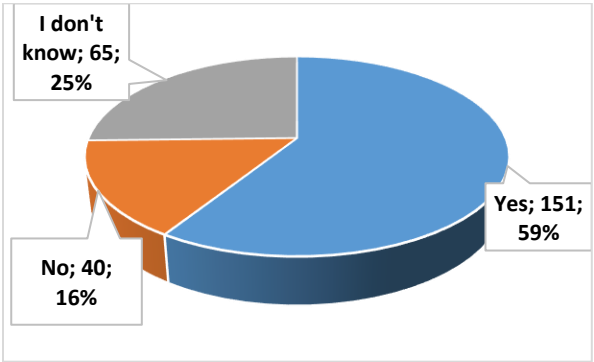
A. B.



Source: Authors' research

Almost 90% (86%) of the students believe there is a link between the oral and the systemic health. In this context, however, 59% verify the role of the genetic predisposition as a factor to develop periodontitis (Figure 6).

Figure 6. There is a genetic predisposition to periodontitis.



Source: Authors' research

4. DISCUSSION

Periodontal disease is one of the top six chronic non-communicable diseases (NCDs) and is recognized as a severe global public health problem.Venkat et al. found a positive association between smoking, alcohol consumption, age, gender, history of diabetic mellitus, and periodontal disease (Venkat & Janakiram, 2023). A meta-analysis from 2022 declared a positive association between obesity and periodontitis regardless of country or age. In the subgroup analysis by age, the risk was the highest in the 18–34 years' group; while in the subgroup analysis by country, European countries had the highest risk ratio (Kim CM, 2022). In their study from 2022, Relvas M et al. studies the risk factors for periodontal disease in Portuguese population. She revealed that increased age, lack of tooth brushing and flossing are identified as potential risk factors for periodontitis (Relvas, López-Jarana, & Monteiro, 2022). According to Darby I. most patients probably have multiple risk factors, some of which are the same for both periodontitis and peri-implantitis (Darby, 2022). The risk factors related to the patient include socio-economic status, smoking, substance use disorders, diabetes, diet and dietary supplements, mental health disorders, old age, poor home dental care etc.(Darby, 2022).

The students that took part in our questionnaire are well aware that there is a string link between oral and systemic health and they associate the deterioration of the oral health with risks such as smoking, an accompanying genetic disease, emotional stress, and poor nutrition diet. However, the results about other factors like age and sex, accompanying chronic illness, overweight and cardiovascular diseases are not so convincing. The students who answered positively regarding those risk factors are 41%, 40%, 31%, and 37%, respectively. Lack of knowledge is evident also when asking students about more advanced information – around 50% of them could not make a link between the level of the inflammatory cytokines and periodontitis or the effect of inflamed teeth on the birth and weight of newborns. Therefore, about 25% of the interviewed don't see the connection between teeth disease and PLBW, while 59% are not sure that such link generally exists. These data means that some knowledge about the basic risk factors for periodontal disease are lacking and we still have a path towards informing the population and, particularly, young people about those diseases.

In recent years, it has been accepted that the role of genetic factors in the pathogenesis of periodontal diseases is extremely important in determining the risk of periodontal disease progression. Currently, variants in at least 65 genes have been suggested as being associated with periodontitis based on genome-wide association studies and candidate gene case control studies (Loos & Van Dyke, 2020). These studies have found pleiotropy between periodontitis and cardiovascular diseases. Most of these studies point to potential pathways in the pathogenesis of periodontal disease (Loos & Van Dyke, 2020). Genetic predisposition as a factor for periodontal diseases is still not familiar among population. In our cohort, only 59% consider it to be an important issue that requires more intensive prophylactic activities in predisposed people compared to those who are not predisposed.

Periodontitis as a chronic condition has an inflammatory nature. As an inflammatory condition, it is characterized by unresolved hyper-inflammation, disruption of the innate and adaptive immune system, dysbiosis of the oral, gut and other location's microbiota and other system-wide alterations (Martínez-García & Hernández-Lemus, 2021). The relationships between the infectious, immune, inflammatory, and systemic features of periodontitis are still not fully understood. Students connect periodontitis with the inflammation or the vise-versa (about 80% state that bleeding could be a symptoms of gingival inflammation), as well as that some bad habits as improper teeth brushing could cause gingival recessions. In spite of the mass advertisement of tooth brushes and promotion of tartar removal, still more than 10% (13%) of the students consider tartar removal to be potentially harmful for their teeth.

Oral health is an important component of overall health that has been shown to influence quality of life—it can impact a person's appearance, social function, and daily physical and psychological activities (Gomes, Abegg, & Fachel, 2009). The participants in the study agree on the consequences of a possible teeth loss as damage of articulation and deterioration of the quality of life (more than 90% are consistent with this statement).

5. CONCLUSION

Diseases of the oral cavity and specifically periodontal diseases have a certain impact on systemic health, which determines the need for the participation of all health care professionals in public programs for the prevention of periodontal diseases and maintenance of clinical periodontal health. The role of health professionals in improving the oral health of the population depends on their awareness and knowledge of oral diseases and their impact on general health, their attitude towards dentistry and their daily commitment to oral health care.

Previous literature indicates that healthcare professionals have a knowledge deficit regarding periodontal disease. A study of the awareness of periodontal disease students in the majors in the "Health care" professional field will allow to identify and analyze the deficits in their awareness regarding one of the two most common oral diseases. This will help them gain knowledge about the nature of periodontal diseases and their associated risk factors, thus improving the awareness of future health care professionals regarding the promotion of periodontal and oral health. Involving

these health professionals alongside dentists in the formation of health strategies and the implementation of public health programs for the prevention and early treatment of periodontal diseases would lead to increased patient awareness and commitment to protecting their own oral health.

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